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NOTES AND COMMENTS.

STAGE SCENERY AND THE VITASCOPE.

When Mr. Edison first made his kinetoscope, and long before it was put generally on public exhibition, he foretold that he would enlarge the effects produced by it, and give life-sized pictures of people, all sorts of animals and mechanisms or other objects in action, with every detail of their movement and every expression of their faces. These "living pictures" in a new sense—these illuminated shadows that have all the naturalness—and a nearly perfect semblance, of reality—could, he said, be used in conjunction with the phonograph and be substituted for real persons and dialogue spoken by them in plays upon the stage.

The development of the vitascope has already in part fulfilled this prediction. Some of us who have seen the results of its operation, and have been stirred to wonder and admiration by its life-like reproductions, have already begun to speculate as to still greater possibilities in store for it. The vitascope is an elaborate machine, on a large scale, which, by means of electric power and light, magnifies and throws upon a screen images previously photographed by the kinetoscope apparatus on a long and narrow sensitized gelatine film, like a ribbon. These small negatives on the gelatine ribbon are made at the rate of from forty-six to fifty per second, while the ribbon is running swiftly along, driven by electricity, behind a photographic lens in the kinetoscope. The lens has a shutter, which opens just long enough to admit one impression of the moving object; then closes, while the ribbon passes on for the space of perhaps a quarter of an inch, and opens again to receive another impression.

Every one of the impressions thus received becomes a perfect and sharply outlined photographic negative, stamped on the ribbon in a small fraction of a second, allowing for the pauses when the automatic shutter is closed and no impression at all is being recorded. In one minute about 3,000 of these negatives are made.

In the kinetoscope this ribbon afterward, for the purpose of bringing together in the spectator's eye the blended images of all the negatives, and so creating for him the total impression of a moving form, is revolved behind a lens at a little higher speed than when the photographs were taken upon it. A small electric light placed under or behind it gives illumination to the figures or other objects on the ribbon, and so makes them visible to the spectator.

The vitascope, a far more complicated and powerful structure, takes this same ribbon which has been prepared by the kinetoscope, and coils it up on a disc at the top of the machine, from which it is passed over a system of wheels and through a narrow, upright clamp-like contrivance that brings it down to a strong magnifying lens, behind which there is an electric burner of high capacity. The light from this carbon burner blazes fiercely through the translucent ribbon, and projects the images on the negatives there, blended, to a distant screen, with great clearness, for the benefit of the audience. The clamp device just mentioned regulates the gliding or the pausing of the gelatine ribbon, and is further assisted by an automatic hammer below it, which recedes and advances fifty times in a second, keeping the ribbon flat and straight as it passes down before the magnifying lens.

In fifty feet of the photographic gelatine film or ribbon there are some 750 negatives. It takes about forty seconds to run fifty feet of this ribbon through the machine and by the magnifiying lens. Photographic ribbons are now made for the vitascope which are 1,000 feet in length and contain the pictures of three different subjects. In this way, one subject may be shown on the screen, and, after a very slight pause during which the light is intercepted by an automatic swinging shutter, the next subject can be exhibited without stopping to adjust a new gelatine ribbon.

The cinematograph, contrived by Lumière, of Paris, which has also been displayed recently in New York, gives much the same results as the Edison vitascope ; but, if I am rightly informed, it is worked on the kinetoscope plan. The pictures are thrown out through a shutter lens, and the continuity of impression is liable to be somewhat broken.

The point that interests us most at present, however, is whether the vitascope can be utilized to replace, in the future, the ordinary stage scenery to which we have now—through many generations of experience and much artistic work—become accustomed. No serious attempt has so far, I believe, been made to use the phonograph in direct coöperation with vitascopes. This may be partly for the reason that no entirely satisfactory transmitter has yet been made for sending out the recorded phonograph speech in a large auditorium. Yet it seems almost inevitable that, in time, a successful combination of the two instruments will be made, so that a play may be given with the actors, the voices, and surroundings created wholly by mechanical means and run by electric motor, supervised by two or three trained assistants. That would be an exhibition copying the drama enacted by living beings, and although somewhat apart from it, yet very useful, no doubt, in private houses, or in places where a theatre and company of actors were lacking. Already, in the vitascope and cinematograph exhibitions, we notice that where breakers are represented, dashing on the seashore, or a charge of cavalry afield, the illusion is heightened by an accompaniment of appropriate rushing and tramping noises behind the scene, or martial music from the orchestra.

But can the vitascope be so used as to make painted scenery unnecessary in plays performed by flesh and blood actors; or is it likely, at any rate, to replace that to some extent and to become a valuable adjunct in certain particulars of scenic effect upon the stage? It may not for a long time hence be adequate for producing all the illusion needed in placing a scene upon the stage; and as its chief attractiveness is in its representing *motion*, it alone would hardly be called upon to supply the various parts of a stage-setting that are without motion. There seems to be little doubt, however, that the vitascope may soon take an important position in heightening theatrical verisimilitude.

Where, for instance, it is desired to show a waterfall in the background, or a sea-shore with waves rolling in on the beach, or a storm at sea, there can be no question that the vitascope would represent these things, taken absolutely from life, with a thousand-fold more effectiveness and pleasure to the audience than anything in the line of most skilful stage device with which we are now acquainted. Marine views, with sailing vessels, steam yachts, and boats in motion—the dimpling and rippling of the water—and people embarking or disembarking, could be rendered with delicious and genuine vividness. Flags fluttering in the wind ; canvas awnings shaking over house-windows; passing clouds, mist, and sunshine in the sky, and puffs of dust in the air could all be conveyed to us without a flaw. A crowd in a background of street ; a busy scene in the markets; the coming and going of vehicles—all these could be shown to perfection. It is easy to see, further, that spectacular effects of distant multitudes, of armies advancing, battling, and retreating could be placed before us as nothing else can place them now. Sir Henry Irving achieves a great stage point with his masqueraders trooping through the scene, in his production of "The Merchant of Venice." Imagine how much more brilliant and veracious the effect might be with vitascope figures for auxiliaries !

Then, too, in any out-door scene—in "As You Like It," for example, or "King Lear" or "Macbeth"—would it not be a great enhancement to have the tree-boughs waving, and sunlight and shadow flickering precisely as in nature?

In the matter of panoramic scenery, furthermore, where it is desired to give the impression that the actors are passing through a long stretch of landscape, either on foot or in boats, the vitascope offers facilities which the next generation will probably enjoy to the full.

Certain practical difficulties will present themselves to the inquiring mind, in considering this subject.

If illuminated vitascope backgrounds are to be used on the stage, how shall we make the actors and their surroundings harmonize? At present, the vitascope picture is thrown from the front of the theatre on to the screen which takes the place of the ordinary "flat" of painted canvas at the back of the stage. If this method were continued the actors would necessarily cast grotesque and disconcerting shadows on the vitascope scenery behind them, up the stage. This difficulty can be obviated by placing the vitascope *behind* the screen on the stage; so that there would be no possibility of its radiance causing shadows from the figures of the living actors in front of the screen. Thin, white, transparent muslin should be used for the screen. The only serious obstacle to using the vitascope reproductions in this way from the rear is the fact that on the stages of some theatres there is not room enough behind the scene for the proper working and effect of this machine.

Another important consideration is that of securing proper colors in vitascope scenery. Entirely satisfactory color effects are now secured in the brilliant reproductions, given at a well-known theatre in New York, of skirt and serpentine dances; but this is accomplished only through the careful hand-painting of every separate negative in the series of thousands that are whirled past the magnifying lens. The process, as may easily be conceived, is laborious and costly; and the colors must then be fixed upon all the tiny negatives of the gelatine ribbon with powerful chemicals, in order to prevent their fading under the intense heat of the carbon burner, to which they are exposed. It does not seem impossible that, for the obtaining of simpler color effects than these, cheaper devices which yet would be adequate may be contrived.

Mr. Edison is now occupied with a much larger form of vitascope—or, as he prefers to call it, kinetoscope—which will make negatives containing as many as *six hundred* moving human figures or other figures in motion; so that immense spectacles may be displayed by it, filling the whole space of the "flat" scene of a theatre. An entire pantomime may thus be reproduced, or a yacht race, a sham battle, a parade, or a horse race with a large part of the onlookers in the grand-stand.

As yet, vitascope exhibitions are confined to episodes lasting from two to five minutes; though, of course, these can be lengthened by running the same or duplicate photographic series past the lens several times in succession. For a waterfall effect or that of a river scene or a wind-stirred forest, this plan of repetition could be advantageously used. Moreover, a thousand-foot ribbon will run for about thirteen minutes; and if this were all devoted to one subject, no repetition would be necessary. Thirteen minutes, in a play, is a long stretch of time.

It may be added here that the cost of actually operating the vitascope is very small. With regard to possible panoramic effects on the stage, also, it is interesting to observe that some of Mr. Edison's assistants, under his direction, have lately made experiments in taking kinetoscopic negatives for use in the vitascope, with a kinetoscope mounted on a revolving platform, so that while the instrument itself remains in the one spot it takes in a large sweep of scenery, which is afterwards brought before us in the vitascope as though it were a landscape that we were viewing while we moved by. I believe that it is intended also to prepare negative ribbons with instruments placed on railroad trains or boats to take in continuous views of the scenery visible from these.

One practical difficulty has been met with, which cannot at present be overcome in all cases, viz., the jarring of the cabinet in which the kinetoscopic recording camera is set. The construction and action of the machine are so fine and so sensitive that slight vibrations interfere with the running of the gelatine ribbon on a line equally true at each movement. This, I understand, is the cause of that slight oscillation or upward and downward jolting of the picture when it comes before us on the screen. The cabinet has to be carried around and set down in all sorts of places; not always with a steady foundation available. In some cases, where conditions have been favorable, the reproduced blended picture is perfectly steady; in others it joggles, as though shaken in its frame. Frequently, too, small flecks or points of sharp white light appear in the picture, with a slightly dazzling effect. These are due to flying motes or particles in the air, which become fixed on the film or ribbon during the process of coating it. No remedy for this minor defect has yet been found. But it is not unreasonable to suppose that, after further effort, all the small drawbacks of the present will be overcome.

Mr. D. Macfarlan Moore, whose display of the vacuum tube electric light in New York, last winter, drew great attention from scientific men and admiration from the public, looks upon the projection of pictures for stage scenery as entirely practicable. The vacuum tube, he says, fitted to give light of almost any tint, would be an ideal means of stage illumination or decoration. But one of the most marvellous applications of vacuum tubes to stage effects, he thinks, will be by the use of induction. Actors may be provided with light glass wands of any conceivable shape, which, by varying the vacuum can be made to radiate light of any desired color; neither the wands nor the actors being connected to anything electrical, since the induction screen influencing the wands or tubes would be placed above the stage and out of sight. Here is another possible solution of the color problem in the "projected" scenery of the theatre of the future.

GEORGE PARSONS LATHROP.

THE TRUTH ABOUT THE OPIUM WAR.

THE article by Mr. David A. Wells which appeared in the NORTH AMERICAN REVIEW for June has for its expressed object to repel an unjust charge commonly brought against the policy of England by American writers. It may seem ungracious on the part of an Englishman to repudiate the plea which he makes in respect of the opium war ; but that portion of his article is, in effect, an attack upon the position taken up by those British citizens who have, during the past half century, spent time and money in seeking to reverse the policy of their own government with regard to the opium traffic—not without many encouragements, and some notable victories. As one of those thus assailed, I trust that I may be allowed to controvert some of the statements contained in the article, which is very far indeed from being, as the writer claims, " a summary of the indisputable facts."

The " complete evidence " which Mr. Wells states to have only recently become popularly accessible to refute the charge against the British government of forcing opium upon China, is manifestly that contained in the appendices to the Report of the Royal Commission on Opium, presented to our Parliament last year. These papers, however, disclosed no new facts of any importance with regard to the opium war : they do but summarize the despatches presented to Parliament at the time, and already used by all competent historians, such as the American Dr. Wells Williams, in his *Middle Kingdom*, and Justin McCarthy, in his *History of Our Own Times.* They have also been fully referred to by the authors of the two prize essays which have become standard monographs on the opium question, the Rev. Storrs Turner, in his *British Opium Policy*, and Mr. J. Spencer Hill, in *The Indo-Chinese Opium Trade.*

To say that the opium war was instituted "in order to force" China to take opium may perhaps be taken to imply that such was the express intention of the statesmen responsible for it, and is therefore a mode of statement which is better avoided. But it is a good old rule of the common law that a man is taken to intend the consequences which he must have known were likely to result, and which have in fact resulted, from his action. For such consequences he is criminally responsible, and the law does not stop to enquire into his motives. Just in this way the government of Lord Melbourne, and the British Parliament, which, by a narrow majority, approved its proceedings, must be held guilty of having forced opium upon China.

The statement that " previous to the inception of the so-called opium war between England and China (*i. e.*, in 1840) opium was cultivated in no less than ten of the provinces of China," contains an important error of date. It is manifestly taken from a paper laid before the Opium Commission by the late Sir Thomas Wade, formerly British Minister in China, and stated by